Response to Maojo and Kulikowski

I appreciate the thoughtful commentary by Maojo and Kulikowski on the 'fundamental theorem' and am delighted to see this idea continue to generate interest.[1]

The 'fundamental theorem,' first introduced in an invited lecture at the University of Washington in 2000,[2] was later described in detail in a *JAMIA* article published in 2009.[3] The 'theorem' was primarily intended to call attention to the basic beliefs that bind us together as a field. It was intended more as an expression of culture than one of formal logic. In the 2009 article, I described as 'audacious' my labeling of this expression as a theorem.

I do believe, however, that the expression meets one of the definitions of a theorem offered in the correspondence by Maojo and Kulikowski: 'an idea accepted or proposed as a demonstrable truth.' I also believe the expression qualifies as a proposition that can be demonstrated or falsified. This is most clear when the 'theorem' is expressed verbally: 'a person working in partnership with an information resource is 'better' than that same person unassisted.'

Because they do not cite the 2009 article,[3] Maojo and Kulikowski imply that my Perspective piece published in 2013[4] is the primary exposition of the 'theorem.' The 2013 article invokes the 'theorem' but provides little of the detail provided in the 2009 publication. Indeed, many important points offered by Maojo and Kulikowski were also offered in the original 2009 paper.

As an example, consider this point from their commentary:

> Computer interaction is hardly as unambiguous as the 'fundamental theorem' suggests. Harvard's Shoshana Zuboff [citation deleted] presciently described how computers introduced by organizations lacking good information models, and socially well-adapted management structures (often by persons lacking adequate skills or understanding of information processes) can hurt, rather than improve work process efficiency and effectiveness.

and my words from the 2009 article, which carry the same intent:

> The theorem can fail to hold, even though the resource has potential to be helpful, if it is used by the person in ways that do not enable the realization of its potential. This can happen because the resource is poorly designed and thus hard to use well, or because the person does not know enough about the domain to make best use of the resource.

As another example, the 2009 paper clarifies what I mean by 'adding together' the brain and machine: 'The 'plus' symbol is employed because of its universal recognition, but is not to be read literally in the sense of mathematical addition.'

In sum, I encourage our colleagues to interpret the commentary by Maojo and Kulikowski with primary reference to the original 2009 article,[3] rather than solely the 2013 piece[4] that appears to be the basis for their commentary.

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REFERENCES

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2 See http://www.worldcat.org/title/2000-biomedical-and-health-informatics-symposium-a-vision-for-informatics-featuring-the-fundamental-theorem-of-medical-informatics/oclc/48067590 (accessed 27 May 2013).
3 Friedman CP. A "fundamental theorem" of biomedical informatics. *J Am Med Inform Assoc* 2009;16:169–70.
4 Friedman CP. What informatics is and isn't. *J Am Med Inform Assoc* 2013;20:224–6.